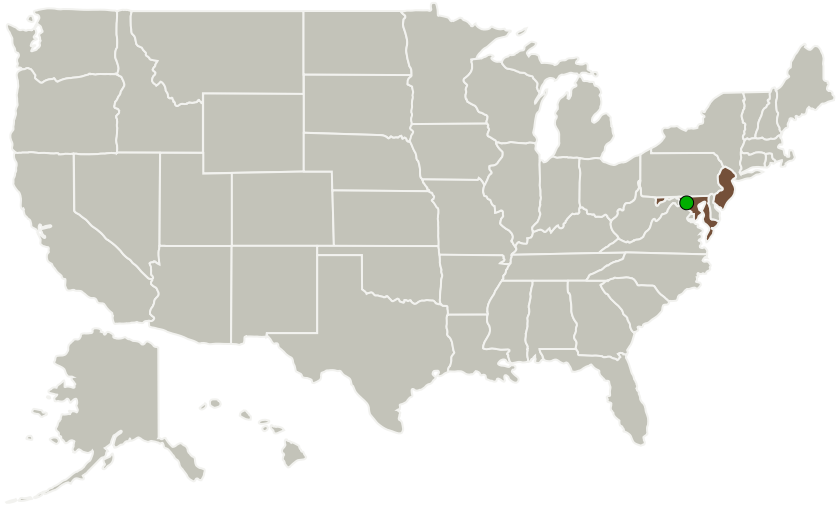
Compact High Performance Spectrometers Using Computational Imaging, Phase I

Completed Technology Project (2015 - 2015)

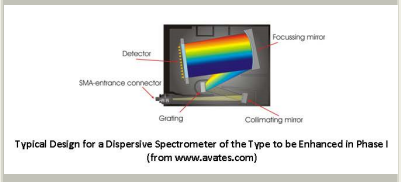
Project Introduction

Energy Research Company (ERCo), in collaboration with CoVar Applied Technologies, proposes the development of high throughput, compact, and lower cost spectrometers that can exceed the performance of much larger and more expensive spectrometers. This performance gain is achieved through the use of computational imaging technology. Because the technology can be used from the deep UV to the IR, applications of the spectrometers include sensing modalities such as Laser Induced Breakdown Spectroscopy (LIBS), Raman spectroscopy, fluorescence spectroscopy, and infrared spectroscopy. The market advantages of the concept are its higher performance than current compact spectrometers, and lower cost, lighter weight, and smaller size as compared to high performance spectrometer systems. The Phase I work plan will consist of building and testing a laboratory bench top prototype to prove the concept.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Energy Research Company	Lead Organization	Industry	Plainfield, New Jersey
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



Typical Design for a Dispersive Spectrometer of the Type to be Enhanced in Phase I (from www.avates.com)

Compact High Performance Spectrometers Using Computational Imaging, Phase I

Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Compact High Performance Spectrometers Using Computational Imaging, Phase I

Completed Technology Project (2015 - 2015)

Primary U.S. Work Locations	
Maryland	New Jersey

Project Transitions

June 2015: Project Start

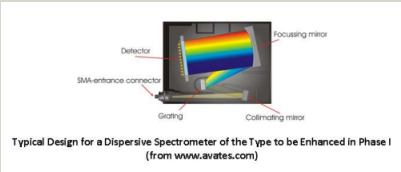
December 2015: Closed out

Closeout Summary: Compact High Performance Spectrometers Using Computational Imaging, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138879)*

Images



Typical Design for a Dispersive Spectrometer of the Type to be Enhanced in Phase I (from www.avates.com)

Briefing Chart Image
Compact High Performance Spectrometers Using Computational Imaging, Phase I
(https://techport.nasa.gov/image/130295)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Energy Research Company

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

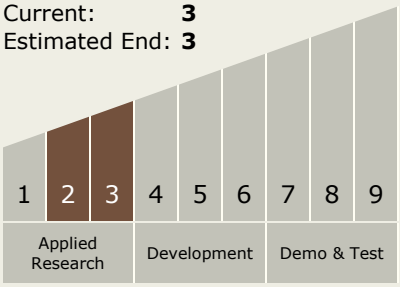
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Arel Weisberg

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Compact High Performance Spectrometers Using Computational Imaging, Phase I

Completed Technology Project (2015 - 2015)

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System